



Students and educators can view real-time information about two dozen educational wind turbines on mobile devices, laptops or desktops via a new widget developed at Idaho National Laboratory.

## Idaho National Laboratory widget brings wind turbine data to students, educators

By Brett Stone, *INL Communications & Governmental Affairs Intern*

Next time you see a teen staring at a cell phone, don't assume text gossip is the focus. The student may in fact be studying how much electricity his or her school's wind turbine is generating. Up-to-the-minute information about two dozen educational wind turbines is now available to students and educators on their iPhones, BlackBerrys and laptops via a new widget created by Idaho National Laboratory researcher Mark McKay.

McKay developed versions of the "widget" for the desktops of Macs and PCs to allow users to conveniently view detailed turbine information such as wind speed, watts of power produced and voltage. The data comes from participating "Wind for Schools" wind turbines located at schools across Idaho and other states including Alaska, Kansas, Colorado and Nebraska. And the audience for such information ranges from grade-school students to university researchers, who can use it to observe, from the convenience of their desks, the real-time activity of turbines just outside their window or miles away.

"It's not a very windy day," said McKay, pointing at the computer monitor in his office. Without even looking out a window, McKay can note many details about the status of a small turbine located across town at Idaho Falls' Skyline High School.

Since the early days of Idaho wind power, INL has collected and analyzed wind data throughout the state. Information from INL studies has helped facilitate much of the industry's development in Idaho. True to that tradition, the widget now helps to educate youth about real-life wind energy basics. "This widget is one of many great examples of how INL researchers are bringing renewable energy into homes and classrooms," said Gary Seifert, INL's Wind Powering America program manager.

INL has helped several schools erect small wind turbines for educational purposes and helped the educators with curricula to aid in [teaching about wind power](#). McKay, who works on robotics data systems at INL, said he wanted a tool that would allow him to check up on one of the local turbines while he was in the office. Writing code for a desktop widget seemed like the simplest solution and McKay originally did most of the work to develop the app on his own time.

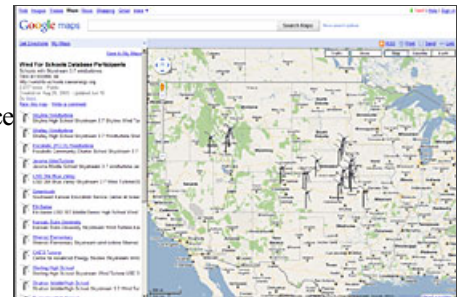
"I wanted something that was quick and easy to look at, something I could display on the desktop all the time or just hit a button real quick on the keyboard to see what the turbine was doing," said McKay.



**A Skystream wind turbine was installed at INL's Center for Advanced Energy Studies last year.**

But Miller said it's not just graduate students who are benefiting.

At a ribbon-cutting ceremony for a local Kansas elementary school's educational wind turbine, Miller said, "The principal asked me to talk to the fourth-graders about the computer monitoring tools, and the widget was the biggest hit. I put it up, and went on to talk about other stuff, and then



***Wind widget users can view real-time information from turbines near and far by simply clicking on the turbine of interest.***

Soon, though, it became apparent that he had hit on something much more valuable. He found himself working with turbine manufacturers and educators at middle schools and colleges to use the widget as an informative tool for "getting the turbine data out to a larger audience."

Now, educators and students from universities all the way down to elementary school are using the device that pools data from an expanding number of participating turbines into a database that feeds the widget.

"I have three copies of the widget on my desktop," said Ruth Miller, a professor at Kansas State University. Her graduate students are currently using the widget as an important tool in their research. The team is trying to develop an algorithm that can predict wind speed at one turbine based on information from other turbines.

the wind (at KSU) picked up and the widget dials went red, and the kids got really excited."

McKay explained that the widget, whose display can even be configured to use a school's colors, does more than just save classes the trouble of directly observing a turbine. The tool allows them to compare different locations.

"That's the other nice thing about the interface here," he said. "If Skyline's not spinning and you want to teach something about wind turbines, they can go find another turbine that actually is spinning."

The small [Skystream turbines](#) that the widget reports data from are part of a larger program called [Wind for Schools](#), which helps rural schools learn about wind energy and provides materials such as small wind turbines for educators. The program's goal is to raise awareness about the benefits of wind energy, and to "develop a wind energy knowledge base in future leaders."

Schools in Mountain Home and Rigby, Idaho, are next in line to get wind turbines and be added to the widget database. McKay hopes the expanding program will help students to connect the dots between natural resources, electricity generation and consumer demand from things like iPods and air-conditioning, "to see how much it really does take to generate power."

For example, while electricity generated by the turbines reduces a school's electric bill, juxtaposing the amount produced with the amount used is just another opportunity for a teaching moment, according to McKay. On the Wind for Schools website, students can see how much [power the city of Idaho Falls uses](#), how much it produces, and how much it has to import. McKay hopes that coupling this with the information from the widget will lead to meaningful classroom discussions about the region and nation's energy future.

Armed with information, students can answer questions like, "How big of a system do you really need and can we develop turbines that are more efficient?" or "Can you predict how much energy you will make tomorrow if you know the weather forecast?" said McKay. "They're aware now of what that thing spinning over there on the pole is."

He also hopes that the tool will widen the horizons of more than just the future engineers. "It creates awareness," said McKay. "[Future] programmers can look at it as an example of what you might program. Graphic artists could design something that would be easy to visually convey the information. It's all about communicating information."

[Feature Archive](#)



***Numerous Idaho students are learning about wind energy through turbines installed at their schools as part of the Wind for Schools program.***